

### **REMARKS/ARGUMENTS**

Claims 10, 12-20 and 29-62 stand in the present application, claims 10 and 29 having been amended. Reconsideration and favorable action is respectfully requested in view of the above amendments and the following remarks.

In the Examiner's Answer, the Examiner has rejected claims 10, 12-20 and 29-40 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement and has rejected the same claims under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. As noted above, Applicants have amended independent claims 10 and 29 in accordance with the suggestions made by the Examiner in order to expeditiously place this case in condition for allowance. Accordingly, claims 10 and 29 and their respective dependent claims 12-20 and 28-40 are believed to patentably define over the Examiner's § 112, first and second paragraph, rejections.

The Examiner has also rejected claims 10, 12-20, 29-45, 48-49, 52-53, 55-56, and 59-60 under 35 U.S.C. §§ 102 and 103 as anticipated or obvious over various cited references. Applicants respectfully traverse the Examiner's §§ 102 and 103 rejections of the claims.

A. Claim 29 is not anticipated under 35 U.S.C. § 102(b) by Heinig.

In view of the above described claim amendments to claim 29, Heinig clearly does not anticipate this claim. More particularly, it is now clearer that the upper tangs (two tangs on each side of the bucket) use their respective straight lines to each respectively define a point of a line that forms an angle of  $25.78^\circ$  with the center line of

the bucket. Conversely, if the two uppermost tangs on each side of the bucket disclosed in the Heinig reference are used, as now more clearly required by the amended claim, to define each respective line then the angle formed between each respective line and the center line is approximately  $15^\circ$  not the required  $25.78^\circ$ .

Moreover, in Heinig the respective lines defined by the two uppermost tangs on each side of the bucket must necessarily lie along tangent lines to the pressure faces of the bottom most tang, since Heinig only has two tangs including the bottommost tang one each side of the bucket. Thus, Heinig does not meet the last limitation in claim 29 "wherein a point defined by intersecting tangent lines along the pressure faces of the bottommost tang does not lie on either line that forms the angle of  $25.78^\circ$  with the center line."

Additionally, Heinig does not disclose a bucket having tangs formed from multiple straight surfaces, as required by claim 29. (Clearly claim 29 requires at least two straight surfaces on each tang, because two respective points are needed to form a line and each respective point is defined by the two straight lines.) Heinig discloses that each of its two tangs are formed from curved surfaces having radii of R1 through R8 and a single flat bearing surface  $b_1$  (for the uppermost tang) and  $b_2$  (for the bottommost tang) as shown in Figure 1 and described at column 4, line 42 through column 5, line 57.

Finally, it is clear that Heinig only discloses a bucket having two tangs (referred to as uppermost lug 22 and lowermost lug 26) and, therefore, does not meet the claim language of claim 29 that requires three tangs – the two uppermost tangs being used to

determine the lines that form the required angular relationship with the center line, and wherein the bottommost tang does not lie along either of the determined lines.

For all of the above reasons, the Examiner's rejection of claim 29 is in error and should be withdrawn.

B. Claims 10, 13-19 and 52-53 would not have been obvious under 35 U.S.C. § 103(a) over Johnson in view of Applicants' Prior Art.

In view of the above described amendments to independent claim 10, Johnson taken singly or in combination with Applicant's prior art, clearly does not teach or suggest the angular relationship required by claim 10. In addition, neither Johnson nor Applicant's Prior Art teach or suggest a wheelpost having a fillet with a radius of curvature of 0.0855 inches as required by independent claim 52. Applicant's Prior Art has only been cited by the Examiner for disclosing "that as many as 92 buckets are present in a turbine" and, therefore, clearly does not solve the deficiencies of Johnson noted above with respect to independent claims 10 and 52.

More particularly, Johnson does not teach or suggest the angular relationship – defined in part by the two uppermost tangs on either side of the bucket – now more clearly required by amended independent claim 10. The Examiner has used a single tang on Johnson to determine a single point through which any line can be drawn to form any angle with the center line of the bucket. Since elementary geometry requires two points to define a line, as does the required claim limitations, the Examiner's rejection is in error. In Johnson, a line defined by the two uppermost tangs of the bucket is shown in Figure 1 as line "TN" and is described in the specification, at column 4, lines 7-9, to be 15.75° not 25.78° as required by claim 10.

With respect to claim 52, Johnson does not teach or suggest a wheelpost fillet having a radius of curvature of 0.0855 inches, as required by claim 52, nor an additional wheelpost fillet having a radius of curvature of 0.0752 inches, as required by claim 53. Johnson actually only discloses tangs on a bucket which the Examiner apparently assumes mirrors the fillets on a wheelpost which is not shown or described in Johnson. In any event, the tangs/fillets of Johnson have multiple radii of curvature and not a single radius of curvature as required by claims 52 and 53. More particularly, the first tang/fillet of Johnson has radii R3 and R4 which although equal in value are effectively two different radii because they are measured from two different points R3C and R4C, respectively. Similarly, the second tang/fillet has radii of R7 and R8 which although equal in value are effectively two different radii because they are measured from two different points R7C and R8C, respectively. See, Johnson at Figure 1 and column 3, lines 30-38 and 48-53. Thus, the tangs/fillets disclosed in Johnson do not meet the claim limitations of claims 52-53.

In view of the amendments to claim 10, it should now be clear that Johnson does not teach or suggest the specific angular relationship required by claim 10 (and dependent claims 13-19). Nor does Johnson teach or suggest the specific dimensional requirement for the fillets in claim 52 and 53. The Examiner assertion that such specific constructions are mere matters of choice in design is wrong and his reliance on *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of this assertion is misplaced. *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case involved an alleged unexpected

result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

Claims 10, 13-19 and 52-53 require specific dimensions and angular relationships, and do not merely recite ranges. Moreover, the claims require multiple specific dimensions and configurations (i.e., fillets and tangs being formed by a combination of curved and straight surfaces, the tangs having specific angular relationship to the center line of the bucket, and/or the fillets having specific radii of curvature) which have been selected from an indefinite number of permutations and combinations for the dimensions, configurations and angular relationships of multiple structures

Even under *KSR*, Applicant's inventions would not have been obvious, since there were an indefinite number of options for the specific number, angular relationships, and dimensions of the tangs and fillets of the buckets and wheelposts. *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (obvious to try a finite number of identified, predictable solutions). The specific relationships and dimensions arrived at in the present claims are not a finite number of identified, predictable solutions in accordance with the holding in *In re Boesch*.

For all of these reasons it is improper for the Examiner to allege that the specific recitations of these claims are mere matters of design choice. Accordingly, claims 10, 13-19 and 52-52 are believed to patentably define over the cited art, taken singly or in combination and, therefore, the Examiner's rejection of these claims should be withdrawn.

C. Claim 12 would not have been obvious under 35 U.S.C. §103(a) over Johnson and Applicants' Prior Art in view of United Kingdom 677,142 (hereinafter "the '142 patent").

In rejecting claim 12, the Examiner has relied on a combination of Johnson, Applicant's Prior Art, and United Kingdom Patent 677,142 (hereinafter "the '142 patent"). As noted above, neither Johnson nor Applicant's Prior Art teach or suggest the required angular relationship of  $25.78^\circ$  between the specifically determined line (using the two uppermost tangs on each side of the bucket) and the center line of the bucket as now more clearly required by amended independent claim 10 from which claim 12 depends. Since, the '142 patent has only been cited for disclosing bucket tangs having an angle of 55 degrees it should be clear that this reference does not solve the deficiency noted above regarding the required angular relationship of  $25.78^\circ$ . Indeed, Figure 1 of the '142 patent clearly indicates that the required angular relationship would be only  $15^\circ$  (i.e., half of the  $30^\circ$  angle shown in Figure 1 of the '142 patent). Accordingly, it is respectfully submitted that claim 12 patentably defines over the cited art, taken singly or in any combination, and that the Examiner's rejection of this claim should be withdrawn.

D. Claim 20 would not have been obvious under 35 U.S.C. §103(a) over Johnson and Applicants' Prior Art in view of Caruso nor over Heinig and Applicants' Prior Art in view of Caruso.

In rejecting claim 20, over a combination of Johnson, Applicant's Prior Art, and Caruso, or a combination of Heinig, Applicant's Prior Art, and Caruso the Examiner merely cites Caruso for disclosing that the "outer tang edge of each wheelpost is scalloped." Thus, it should be clear that Caruso does not solve the deficiencies noted above with respect to Johnson and Applicant's Prior Art as applied against independent claim 10. Nor does Caruso solve the deficiencies noted above with respect to Heinig as applied against claim 29 which requires the same angular relationship of claim 10. More particularly, none of these references teaches or suggest the required angular relationship of amended independent claim 10 from which claim 20 depends. Accordingly, claim 20 is believed to patentably define over the cited art taken singly or in any combination.

E. Claims 10, 16-17, 19, 44-45, 55-56 and 59-60 would not have been obvious under 35 U.S.C. § 103(a) over Heinig in view of Applicants' Prior Art.

Claim 10 and its dependent claims 16-17, and 19 patentably distinguish over the cited art because as discussed above with respect to claim 29, Heinig does not teach or suggest the specific angular relationship required by independent claim 29 which is also required by independent claim 10. More particularly, amended claim 10 now more clearly requires that the upper tangs (two tangs on each side of the bucket) use their respective straight lines to each respectively define a point of a line that forms an angle of 25.78° with the center line of the bucket. Conversely, if the two uppermost tangs on

each side of the bucket disclosed in the Heinig reference are used to define each respective line then the angle formed between each respective line and the center line is approximately  $15^\circ$  not the required  $25.78^\circ$ .

Moreover, in Heinig the respective lines defined by the two uppermost tangs on each side of the bucket must necessarily lie along tangent lines to the pressure faces of the bottom most tang, since Heinig only has two tangs including the bottommost tang one each side of the bucket. Thus, Heinig does not meet the last limitation in claim 10 "wherein a point defined by intersecting tangent lines along the pressure faces of the bottommost tang does not lie on either line that forms the angle of  $25.78^\circ$  with the center line."

Additionally, Heinig does not disclose a bucket having tangs formed from multiple straight surfaces, as required by claim 10. (Clearly claim 10 requires at least two straight surfaces on each tang, because two respective points are needed to form a line and each respective point is defined by two straight lines.) Heinig discloses that each of its two tangs are formed from curved surfaces having radii of R1 through R8 and a single flat bearing surface  $b_1$  (for the uppermost tang) and  $b_2$  (for the bottommost tang) as shown in Figure 1 and described at column 4, line 42 through column 5, line 57.

Finally, it is clear that Heinig only discloses a bucket having two tangs (referred to as uppermost lug 22 and lowermost lug 26) and, therefore, does not meet the claim language of claim 29 that requires three tangs – the two uppermost tangs being used to determine the lines that form the required angular relationship with the center line, and wherein the bottommost tang does not lie along either of the determined lines.

Applicant's Prior Art has only been cited by the Examiner for disclosing that as many as 92 buckets are present in a turbine and, therefore, clearly does not solve the deficiencies of Heinig noted above with respect to independent claim 10. For all of the above reasons, the Examiner's rejection of claims 10, 16-17, and 19 is in error and should be withdrawn.

The Examiner admits that neither Heinig nor Applicant's Prior Art disclose the specific angular relationship of claims 10, 16-17, and 19 nor the specific dimensional relationships for the fillets and tangs of claims 44-45, 55-56 and 59-60. In rejecting the claims the Examiner improperly asserts that the specific angular and dimensional relationships given for the fillets and tangs in these claims are mere matters of choice in design, and cites to *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of his assertion.

As noted above, *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case involved an alleged unexpected result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

Claims 10, 16-17, 19, 44-45, 55-56, and 59-60 require specific dimensions and angular relationships, and do not merely recite ranges. Moreover, the claims require multiple specific dimensions and configurations for the buckets and wheelposts (i.e., fillets and tangs being formed by a combination of curved and straight surfaces, the

tangs having specific angular relationship to the center line of the bucket, and/or the fillets having specific radii of curvature) which have been selected from an indefinite number of permutations and combinations for the dimensions, configurations and angular relationships of multiple structures

Even under *KSR*, Applicant's inventions would not have been obvious, since there were an indefinite number of options for the specific number, angular relationships, and dimensions of the tangs and fillets of the buckets and wheelposts. *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (obvious to try a finite number of identified, predictable solutions). The specific relationships and dimensions arrived at in the present claims are not a finite number of identified, predictable solutions in accordance with the holding in *In re Boesch*.

For all of these reasons it is improper for the Examiner to allege that the specific recitations of these claims are mere matters of design choice. Accordingly, claims 10, 16-17, 19, 44-45, 55-56, and 59-60 are believed to patentably define over the cited art, taken singly or in combination and, therefore, the Examiner's rejection of these claims should be withdrawn.

F. Claims 29-33 would not have been obvious under 35 U.S.C. § 103(a) over Johnson.

In view of the above described amendments to independent claim 29, Johnson taken singly or in combination with Applicant's prior art, clearly does not teach or suggest the angular relationship required by claim 29. In addition, neither Johnson nor Applicant's Prior Art teach or suggest a bucket having a bottom tang with radii of curvatures of 0.1992 inches and 0.3360 inches as required by claim 33. Applicant's

Prior Art has only been cited by the Examiner for disclosing "that as many as 92 buckets are present in a turbine" and, therefore, clearly does not solve the deficiencies of Johnson noted above with respect to the rejected claims.

More particularly, Johnson does not teach or suggest the angular relationship – defined in part by the two uppermost tangs on either side of the bucket – now more clearly required by amended independent claim 29. The Examiner has used a single tang on Johnson to determine a single point through which any line can be drawn to form any angle with the center line of the bucket. Since elementary geometry requires two points to define a line, as does the required claim limitations, the Examiner's rejection is in error. In Johnson, a line defined by the two uppermost tangs of the bucket is shown in Figure 1 as line "TN" and is described in the specification, at column 4, lines 7-9, to be 15.75° not 25.78° as required by claim 29.

With respect to claim 33, Johnson does not teach or suggest a bucket tang having the specified radii.

The Examiner admits that the cited prior art does not disclose the specific angular relationship of claims 29-33 nor the specific dimensional relationships for the fillets and tangs of claims 30-33. In rejecting the claims the Examiner improperly asserts that the specific angular and dimensional relationships given for the fillets and tangs in these claims are mere matters of choice in design, and cites to *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of his assertion.

As noted above, *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case

involved an alleged unexpected result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

The Examiner's assertion that such specific constructions are mere matters of choice in design is wrong and his reliance on *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of this assertion is misplaced. *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case involved an alleged unexpected result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

Claims 29-33 require specific dimensions and angular relationships, and do not merely recite ranges. Moreover, the claims require multiple specific dimensions and configurations (i.e., fillets and tangs being formed by a combination of curved and straight surfaces, the tangs having specific angular relationship to the center line of the bucket, and/or the fillets having specific radii of curvature) which have been selected from an indefinite number of permutations and combinations for the dimensions, configurations and angular relationships of multiple structures

Even under *KSR*, Applicant's inventions would not have been obvious, since there were an indefinite number of options for the specific number, angular relationships, and dimensions of the tangs and fillets of the buckets and wheelposts.

*KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (obvious to try a finite number of identified, predictable solutions). The specific relationships and dimensions arrived at in the present claims are not a finite number of identified, predictable solutions in accordance with the holding in *In re Boesch*.

For all of these reasons it is improper for the Examiner to allege that the specific recitations of these claims are mere matters of design choice. Accordingly, claims 29-33 patentably define over the cited art, taken singly or in combination and, therefore, the Examiner's rejection of these claims should be withdrawn.

G. Whether claims 34-40 would have been obvious under 35 U.S.C. §103(a) over Johnson in view of Leonardi.

In rejecting claims 34-40 the Examiner has relied on a combination of Johnson and Leonardi. As noted above, Johnson does not teach or suggest the required angular relationship of 25.78° between the specifically determined line (using the two uppermost tangs on each side of the bucket) and the centerline in independent claim 29 from which claims 34-40 depends. Since Leonardi has only been cited for disclosing tangs formed from curved surfaces with more than one radii of curvature, it should be clear that this reference does not solve the deficiency of Johnson as noted above regarding the required angular relationship of 25.78°.

Accordingly, it is respectfully submitted that claims 34-40 patentably define over Johnson and Leonardi, taken singly or in combination, and that the Examiner's rejection of these claims should be withdrawn.

H. Whether claims 41-43 would have been obvious under 35 U.S.C. §103(a) over Pisz in view of Applicants' Prior Art.

The Examiner admits that the cited prior art does not disclose the specific dimensions of claims 41-43. In rejecting the claims the Examiner improperly asserts that the specifically required dimensions given for the fillets and tangs in these claims are mere matters of choice in design, and cites to *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of his assertion.

As noted above, *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case involved an alleged unexpected result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

The Examiner's assertion that such specific constructions are mere matters of choice in design is wrong and his reliance on *In re Boesch*, 617 F.2d 272 (CCPA 1980) for support of this assertion is misplaced. *In re Boesch* involved a chemical composition case in which there were overlapping ranges between the claimed constituents and those disclosed in the prior art, and only a single variable was involved. More particularly, the cited case involved an alleged unexpected result for the concentration of a single constituent material. Neither of these factors is present here where an indefinite number of solutions involving multiple variables exists and, accordingly, the Examiner's cited case law is inapposite.

Claims 41-43 require specific dimensions, and do not merely recite ranges. Moreover, the claims require multiple specific dimensions and configurations (i.e., fillets

and tangs being formed by a combination of curved and straight surfaces, the tangs and/or the fillets having specific radii of curvature) which have been selected from an indefinite number of permutations and combinations for the dimensions, and configurations of multiple structures.

Even under *KSR*, Applicant's inventions would not have been obvious, since there were an indefinite number of options for the specific number, angular relationships, and dimensions of the tangs and fillets of the buckets and wheelposts. *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (obvious to try a finite number of identified, predictable solutions). The specific relationships and dimensions arrived at in the present claims are not a finite number of identified, predictable solutions in accordance with the holding in *In re Boesch*.

For all of these reasons it is improper for the Examiner to allege that the specific recitations of these claims are mere matters of design choice. Accordingly, claims 41-43 patentably define over the cited art, taken singly or in combination and, therefore, the Examiner's rejection of these claims should be withdrawn.

I. Claims 48-49 would not have been obvious under 35 U.S.C. §103(a) over Heinig and Applicants' Prior Art in view of Phipps.

In rejecting claims 48-49 the Examiner has applied Phipps in combination with Heinig and Applicant's Prior Art. The Examiner admits that none of the cited references discloses any of the specific dimensions for the tangs and fillets required by the rejected claims.

Indeed, Phipps is only being cited for disclosing 55° for the angle between the upper most straight portion of the upper most fillet and the upper most straight portion of

the upper most tang instead of the required angle of 50° in claims 48 and 49. Moreover, Phipps does not even disclose the Examiner's alleged angle of 55° anywhere in its specification. Nor is there any figure in Phipps from which an accurate measurement of the angle could be obtained – Figures 1 and 2 are perspective drawings and Figure 3 is a partial drawing that does not even show the upper fillet and tang from which the required angle could be measured.

**In addition, there are no straight surfaces on the tangs from which to make the Examiner's alleged measurement.** Claims 48 and 49 require the measurement to be made from "the upper most straight portion of the upper most tang." However, Phipps discloses that its tang edges 50 are not straight but undulating (, i.e., wavy or curved). See Phipps at column 3, lines 40-45 and Figure 3. Suffice it to say, absent the hindsight provided by the present application, no one of ordinary skill in the art would have looked to Phipps for the suggestion of a measurement that is nowhere disclosed therein – a measurement that the Examiner alleges is to be made from viewing a partial figure and from a straight surface of a tang that does not exist in Phipps.

Since none of the cited references teach or suggest the specific dimensional and relationships of the tangs and fillet required by claims 48 and 49, these claims are believed to patentably define over the cited art taken singly or in combination.

Therefore, in view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all of the claims, standing in the application, be allowed and that the case be passed to issue. If there are any other issues remaining which the Examiner believes could be resolved through either a

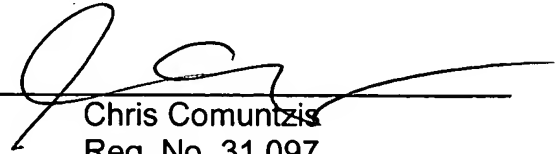
LAGRANGE et al.  
Appl. No. 10/774,399  
February 28, 2011

supplemental response or an Examiner's amendment, the Examiner is respectfully requested to contact the undersigned at the local telephone exchange indicated below.

Respectfully submitted,

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